

1 What is claimed is:

2 1. A hand held oral irrigation device having a tip for dispensing fluids,
3 comprising:

4 a reservoir for storing fluids; and

5 a body;

6 wherein the body and the reservoir define a first major diameter at a lower
7 end of the oral irrigation device and define a second major diameter at an upper
8 end of the oral irrigation device, the first major diameter being larger than the
9 second major diameter.

10 2. The device of claim 1, wherein the body further comprises a motor,
11 a pump, and a drive mechanism coupling the motor to the pump, said pump for
12 controllably delivering the fluids from the reservoir to the tip.

13 3. The device of claim 2, further comprising:

14 a three-way control structure having a first button for activating the motor,
15 a second button for de-activating the motor, and a third button for releasing the
16 tip from the body.

17 4. The device of claim 2, wherein the drive mechanism includes a
18 pump gear coupled with said motor, wherein the pump gear includes an eccentric
19 offset disc extending from said pump gear.

20 5. The device of claim 4, wherein the drive mechanism further
21 comprises:

1 a connecting rod coupled with the eccentric offset disc.

2 6. The device of claim 5, wherein the connecting rod further
3 comprises:

4 a hollow cylindrical portion receiving the eccentric offset disc of the pump
5 gear;

6 an arm extending from the cylindrical portion; and

7 a ball end positioned at the end of said arm.

8 7. The device of claim 2, wherein the pump includes:

9 a pump head having an inlet fluid port, an outlet fluid port, and an interior
10 fluid channel in fluid communications with said inlet and outlet fluid ports;

11 a pump body defining a cylindrical chamber in fluid communications with
12 said interior fluid channel of said pump head; and

13 a piston having a bottom portion and a top portion, the bottom portion
14 receiving at one end the ball end of the connecting rod, said piston positioned
15 within said cylindrical chamber of the pump body;

16 wherein the inlet fluid port is fluidly coupled with the reservoir, and the
17 outlet fluid port is fluidly coupled with the tip.

18 8. The device of claim 7, wherein the top portion of the piston
19 includes:

20 an annular flange;

1 an interior pedestal; and

2 an annular recess defined between the annular flange and the interior
3 pedestal.

4 9. The device of claim 7, wherein the pump further comprises:

5 an inlet fluid valve regulating fluid flow into said inlet fluid port; and

6 an outlet fluid valve regulating fluid flow into said outlet fluid port.

7 10. The device of claim 9, wherein when the piston is moved
8 downwardly within the cylindrical chamber of the pump body, the inlet fluid
9 valve is open, the outlet fluid valve is closed, and fluid is drawn from the inlet
10 port into the cylindrical chamber of the pump body.

11 11. The device of claim 9, wherein when the piston is moved upwardly
12 within the cylindrical chamber of the pump body, the inlet fluid valve is closed,
13 the outlet fluid valve is open, and fluid is expelled from the cylindrical chamber
14 of the pump body to the outlet fluid valve for delivery to the tip.

15 12. The device of claim 9, wherein the inlet fluid valve includes a first
16 reed valve made of flexible fabric material.

17 13. The device of claim 9, wherein the outlet fluid valve includes a
18 second reed valve made of flexible fabric material.

19 14. The device of claim 10, wherein the first reed valve includes:

20 a rim defined on a portion of a perimeter of the first reed valve;

21 a hinge portion; and

1 a flap portion interior to the rim, a first end of said flap portion attached to
2 the hinge portion, said flap positioned relative to the rim so as to define a
3 crescent shaped opening.

4 15. The device of claim 12, wherein the flap portion has a diameter, and
5 wherein the interior fluid channel of the pump head has a diameter, the diameter
6 of the flap portion being larger than the diameter of the interior fluid channel.

7 16. The device of claim 1, wherein the reservoir is detachable from the
8 body.

9 17. The device of claim 1, wherein the reservoir has a top portion and a
10 bottom portion, the top portion having a first cross section, the bottom portion
11 having a second cross section, the second cross section being larger than the first
12 cross section.

13 18. The device of claim 1, wherein the reservoir further comprises:

14 an opening positioned at a top end; and
15 a lid releasably secured about said opening.

16 19. The device of claim 7, wherein the body further comprises:

17 an inlet conduit fluidly coupling said reservoir with said inlet fluid port;
18 and

19 an outlet conduit fluidly coupling said outlet fluid port with said tip.

20 20. The device of claim 7,

1 wherein the body further comprises an inlet conduit fluidly coupling said
2 reservoir with said inlet fluid port; and

3 wherein the reservoir further comprises a fluid access valve fluidly
4 coupling with said inlet conduit.

5 21. The device of claim 20,

6 wherein the reservoir further comprises:

7 a shelf portion defined about a bottom portion of the reservoir; and

8 a base at the bottom end of the reservoir; and

9 wherein the fluid access valve further comprises:

10 a channel defined within the reservoir extending from the shelf to
11 the base, said channel receiving said inlet conduit;

12 a seal positioned about the top end of the channel;

13 a spring extending upwardly from the base within the reservoir;

14 a ball positioned within the channel between said seal and said
15 spring; and

16 a reservoir inlet conduit positioned along the base of the reservoir,
17 the reservoir inlet conduit fluidly coupled with the channel, so that fluid is drawn
18 from the bottom of the reservoir.

1 22. The device of claim 9, wherein the inlet fluid valve of the pump is
2 vertically positioned within the body at a location lower than a full level of fluid
3 in the reservoir, thereby self priming the pump with said fluid.

4 23. The device of claim 1,

5 wherein the tip further comprises an annular groove; and

6 wherein the body further comprises:

7 a tip holding structure having a cylindrical wall defining a
8 cylindrical opening;

9 a slot defined within said cylindrical wall;

10 a clip having an interior lip, said interior lip positioned within said
11 slot and extending into said cylindrical opening; and

12 a spring for biasing the lip of the clip into the slot;

13 wherein when the spring is uncompressed, the lip is received within the
14 annular groove of the tip to secure the tip to the body.

15 24. The device of claim 1, wherein the reservoir has a capacity of
16 approximately 120 to 200 ml of fluid.

17 25. The device of claim 2, wherein the body includes a wall structure
18 defining a first and second section within the body, the first section containing
19 the pump, and the second section contains the motor and the drive mechanism,
20 wherein the first and second sections are fluidly isolated.

1 26. A hand held oral irrigation device having a tip for dispensing fluids,
2 comprising:

3 a reservoir for storing fluids; and

4 a body including a pump for pumping fluids from the reservoir to the tip,
5 wherein said pump includes an inlet valve and an outlet valve, the inlet valve
6 including a reed valve made of flexible fabric material.

7 27. The device of claim 26, wherein the outlet valve includes a reed
8 valve made of flexible fabric material.

9 28. The device of claim 26, wherein the reed valve includes:

10 a rim defined on a portion of a perimeter of the reed valve;

11 a hinge portion; and

12 a flap portion interior to the rim, a first end of said flap portion attached to
13 the hinge portion, said flap positioned relative to the rim so as to define an
14 opening.

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